

BUFFUMVILLE LAKE
CHARLTON, MASS.

FOREST MANAGEMENT PLAN
MASTER PLAN APPENDIX B

AND

FISH AND WILFLIFE MANAGEMENT PLAN
MASTER PLAN APPENDIX D

Department of the Army
New England Division, Corps of Engineers
Operations Division
Waltham, Massachusetts

March 1981

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DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL

NEDOD-P

SUBJECT

Master Plans, Appendices B & D, Forests and Fish and Wildlife Management Plan, Buffumville Lake

TO

See Distribution

FROM

Chief, Operations
Division

DATE

31 July 1981
Mr. Mitchell/bp/305

CMT 1

1. The subject appendices, prepared in accordance with ER 1130-2-400, dated May 1971, has been approved by the Division Engineer.
2. The plan has been developed to increase the value of reservoir lands for recreation and wildlife, and to promote natural ecological conditions by following accepted conservation practices.
3. This plan has been developed in coordination with the U.S. Fish and Wildlife Service, and the Massachusetts Divisions of Forests and Parks; and Fisheries and Wildlife.

Incl
as


ANDRELIUNAS

Distribution:

- (2) CDR USACE (DAEN-CWO-N)
WASH D C 20314
- (15) Operations Division, NED
- (1) Planning Division, NED
- (1) Engineering Division, NED
- (1) Real Estate Division, NED
- (5) Basin Manager, TRB
- (5) Project Manager, Buffumville Lake
- (5) Massachusetts Executive Office
of Environmental Affairs

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DISPOSITION FORM

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REFERENCE OR OFFICE SYMBOL

NEDOD-P

SUBJECT

Master Plan Appendices B and D, Forest and Fish
and Wildlife Management Plan, Buffumville Lake

TO

Commander

FROM

Chief, Operations Division

DATE

18 July 1981

Mitchell/dmr/305

CMT 1

1. Inclosed for your approval is the Forest and Fish and Wildlife Management Plan for Buffumville Lake. This plan will serve as Appendices B and D to the Master Plan for this project.

2. It has been prepared in conjunction with ER 1130-2-400, dated 28 May 1971. It has been reviewed by NED Planning, Engineering and Real Estate Divisions; and the U.S.D.A. Soil Conservation Service; and the Massachusetts Division of Forest and Parks and Fish and Wildlife. Appropriate changes have been incorporated.

3. Division Engineers have been designated as approval authority for these plans by ER 1130-2-400. Information copies are to be forwarded to OCE upon approval.

Incl
as


ANDRELIUNAS

CF:
Operations Div File

TO: Chief, Operations
Division

FROM: Commander

DATE:

CMT 2

APPROVED



DISAPPROVED





C. E. EDGAR, III
Colonel, Corps of Engineers
Commanding

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BUFFUMVILLE LAKE
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ACKNOWLEDGEMENTS

The Corps of Engineers, New England Division, wishes to thank the following people for their effort in developing this natural resource management plan:

Mr. John Clarkin - Park Manager TRB

Ms. Joan Cyr - Park Ranger TRB

Mr. Charles Freeman - Planning Division

Mr. David Wood - Engineering Division

Mr. Russel Keller - Real Estate Division

Mr. John Mitchell - Operations Division

Ms. Louraine Bogosian - Word Processing

Reprographics Section - Graphics and Reproduction

Also, thanks to the U.S. Fish and Wildlife Service and the Massachusetts Division of Fisheries and Wildlife for their review comments of this plan.

BUFFUMVILLE LAKE
CHARLTON, MASSACHUSETTS

TABLE OF CONTENTS

| | <u>Page No.</u> |
|--|-----------------|
| 1. INTRODUCTION | 1-1 |
| Purpose | 1-1 |
| Authority | 1-1 |
| Management Objectives | 1-1 |
| Coordination | 1-1 |
| 2. PROJECT DESCRIPTION | 2-1 |
| Location | 2-1 |
| Acquisition | 2-1 |
| History | 2-1 |
| 3. PHYSICAL AND ECOLOGICAL CHARACTERISTICS | 3-1 |
| Topography | 3-1 |
| Climate | 3-1 |
| Geology and Soils | 3-1 |
| Area Classification | 3-2 |
| Forest Inventory | 3-2 |
| Forest Types | 3-2 |
| Dam and Recreation Areas | 3-3 |
| Water | 3-3 |
| 4. FOREST MANAGEMENT | 4-1 |
| Factors Influencing Forest Management | 4-1 |
| Access | 4-1 |
| Aesthetics | 4-1 |
| Forest Protection | 4-1 |
| Insects | 4-1 |
| Diseases | 4-2 |
| Air Pollution | 4-2 |
| Erosion Control | 4-2 |
| Plantings | 4-3 |
| Thinnings | 4-3 |
| Other Forest Management Operations | 4-4 |
| Boundary Maintenance | 4-4 |
| Fuelwood Cutting | 4-4 |
| Salvage Cutting | 4-5 |
| Management Direction | 4-5 |
| 5. AQUATIC MANAGEMENT | 5-1 |
| Existing Management | 5-1 |
| Endangered Species | 5-1 |

TABLE OF CONTENTS (Cont'd)

| | |
|---|---------|
| Factors Influencing Fish Management | 5-1 |
| Habitat | 5-1 |
| Water Quality | 5-1 |
| Water Level Fluctuation | 5-2 |
| Aquatic Weeds | 5-2 |
| Pesticide Use | 5-2 |
| Access and Fishing Pressure | 5-3 |
| Aquatic Management Program | 5-3 |
| Habitat Improvement and Maintenance | 5-3 |
| Law Enforcement | 5-3 |
| 6. WILDLIFE MANAGEMENT | 6-1 |
| Major Species | 6-1 |
| Factors Influencing Wildlife Management | 6-1 |
| Forest Management Effects on Wildlife | 6-1 |
| Hunter Access and Designation of Hunting Areas | 6-1 |
| Wildlife Observation | 6-2 |
| Wildlife Management Program | 6-2 |
| Existing Management | 6-2 |
| 7. SPECIAL NEEDS | 7-1 |
| Training | 7-1 |
| Research Cooperation | 7-1 |
| Information and Education | 7-1 |
| Interpretive Programs | 7-2 |
| 8. PERSONNEL AND FUNDING REQUIREMENTS TO IMPLEMENT PLAN | 8-1 |
| Fish and Wildlife Management | 8-1 |
| REFERENCES | |
| EXHIBIT A. TABLES | |
| EXHIBIT B. MAPS OF BUFFUMVILLE LAKE | |

SECTION 1. INTRODUCTION

Purpose

The lands, forests, and waters of Buffumville Lake are valuable assets to the surrounding areas providing diverse recreational opportunities and preserving natural areas in public ownership as well as protecting the lakes and streams within the flood control project. The intelligent management of the lands and waters according to sound ecological practices will insure their existence and continued productivity for future generations.

Authority

This plan constitutes Appendix B (Forest Management Plan) and Appendix D (Fish and Wildlife Management Plan) to the project master plan authorized under ER-1130-2-400 dated 28 May 1971.

Management Objectives

The objectives of this management plan are to outline management practices which are compatible with flood control operations and multiple-use practices at Buffumville Lake, and to provide for the proper ecological management of forest, fish and wildlife resources.

Specific objectives are:

- Protect and enhance the natural beauty and character of the area.
- Develop fish and wildlife habitat to attract and support the greatest variety of naturally occurring species.
- Provide for recreational use of project natural resources including hunting, fishing, nature observation, and other day use.
- Maintain a healthy, vigorous forest.
- Provide wood products for project and commercial purposes.

Coordination

Development of this plan has been coordinated with the USDI Fish and Wildlife Service, USDA Soil Conservation Service, Massachusetts Division of Forests and Parks, Division of Fisheries and Wildlife, Division of Water Pollution Control, the Town of Dudley and the Town of Charlton.

SECTION 2. PROJECT DESCRIPTION

Location

Buffumville Lake is located on the Little River in South Central Massachusetts 1.3 miles above the confluence of the Little and French Rivers. The reservoir lies in the town of Charlton with a few acres of land near the dam in the town of Oxford. Access to the site is provided by Massachusetts Route 52, Massachusetts Route 12, and U.S. Route 20.

Acquisition

Buffumville Lake is an element of the flood protection plan for the Thames River Basin which was approved by the Flood Control Act dated 18 August 1941 (Public Law No. 228, 77th Congress, 1st Session). The total area of the project is 761 acres, of which 488 acres were purchased in fee and 273 acres are held in flowage easement. Construction of the project was completed in April, 1958.

History

The Little River has had very little or no effect on the history of the Charlton area. The Quinebaug River and its tributary, Cady Brook, which flow through the northwestern part of Charlton, were more favorable for industrial development. The larger and faster-moving Quinebaug was much more suitable for the development and support of manufacturing enterprises.

In the early 1800's, Charlton boasted tanneries, manufacturers of hoes and scythes, a woolen mill, a gin distillery, and a malt house and brewery. The town of Charlton prospered with industry until the 1880's when agriculture began to dominate. The agricultural phase was short-lived due to the gravelly soils and gave way to dairying, poultry, and grain production which are presently leading the agricultural fields. Charlton woolen mills persisted through the fading of manufacturers and is now the leading industry. Located on Cady Brook, it produces cloth mainly from reclaimed wool and synthetic fibers.

This activity has had no effect on the Little River although it has made a significant impact on the Quinebaug. The banks of the Little River remain mostly forested or in residential use whereas mills and commercial establishments line the Quinebaug.

SECTION 3. PHYSICAL AND ECOLOGICAL CHARACTERISTICS

Topography

The topography of the Buffumville Lake area is generally a narrow strip of steeply pitched hillside surrounding the lake with moderate relief in some areas. A narrow band of wetland shrubs and herbs has become established on the river banks and flood plains, with the higher elevations from the riverbed being thickly forested. Elevations in the vicinity of the reservoir range from about 492 msl in the streambed at the dam site to about 550 N.G.V.D. in the uplands of Buffumville State Park.

Climate

The average annual temperature for the project area is about 48°F. Average temperatures for January and July are 26°F and 70°F respectively. Extremes of over 100°F and minus 15°F occur infrequently. The length of the frost free period is approximately 180 days.

Precipitation is evenly distributed throughout the year, averaging 46 inches annually. Snowfall varies over the Quinebaug basin with an average annual depth of 56.5 inches in Worcester at 986 feet N.G.V.D.

Average annual runoff is 22.5 inches for the Thames River basin which is just over 50 percent of the average annual precipitation.

Geology and Soils

The Quinebaug River basin is geological part of the Central Highlands of Massachusetts and northeastern Connecticut. The bedrock underlying the area is chiefly granite rocks and phyllites. The Little River flows through a narrow post glacial valley with occasional broad flatlands lined with a narrow strip of alluvium along the river. The hilltops are underlain by till, and the slopes immediately above the lake are in stratified drift with small swamp deposits in lower depressions.

In general, the land is steep with good to poor drainage making it inadequate for agriculture or development. The Project Operations Area around the dam, Buffumville State Park, the west side of the lake near Putnam Road, a narrow strip at the north end of Colicum Reservoir, and the Dudley Parcel are broad and flat but the shallow bedrock makes these areas limited in development potential.

An accurate updated soils map has not been prepared for the Buffumville Lake area. The USDA Soil Conservation Service is presently working toward mapping the soils of the entire State by the early 1980's. When available this information will help guide management efforts.

Area Classification

Forest Inventory

A timber cruise was conducted during the fall of 1980. Aerial photos were used to delineate forest types and to determine height classes and percentage of crown closure. Field surveys were then conducted to classify each type according to the guidelines in Forest Cover Types of North America, published by the Society of American Foresters (1975). Exhibit A, Table 1 gives a listing of land classifications and forest cover types with acreage of each. A list of common and scientific names of trees is in Table 3.

Variable radius plots were taken at random locations in each forest type using a prism with a 10 basal area factor. Table 2 gives estimates of timber volume by species on the project. The estimates were based on the International 1/4 inch rule and Gerard form class 78. Volume estimates occurred at the 90% confidence level.

Forest Types

There are five forest types at Buffumville Lake on 37.5% of the total fee acreage. The most extensive is type 20, white pine - northern red oak - white ash, which is found on 101 acres. Generally found on fertile, well-drained soils, eastern white pine and northern red oak are the dominant trees of the canopy. Red maple, black cherry, and white oak are the chief associates.

The second largest type is type 21, white pine. White pine occurs in nearly pure stands with scattered northern red oak, and red maples. White pine is a long-lived species that seldom succeeds itself, except in the case of wild fire or when proper silvicultural management is used. This type covers 37 acres.

The third forest type to be found is northern red oak - basswood - white ash, type 54. This mixed hardwood association is found around the north end of Colicum Reservoir on deep fertile, moist, well-drained soils. The most prominent tree in the stand is northern red oak with associates including red maple, white pine, yellow and paper birch, quaking and big-tooth aspen, black cherry, and eastern hemlock.

The two smallest forest types are white oak (type 53) and aspen (type 16) on 14 and 12 acres respectively. White oak is found along the west shore of Buffumville Lake in a nearly pure stand. Associated species are northern red oak in more moist spots, red maple, and an occasional white pine. There is no access to this area.

Aspen (Type 16) is a pioneer type occurring after wildfire and clear-cuts, and is usually succeeded by white pine or northern hardwoods. Aspen is found on wet sites unsuitable for pine or oak at the northern tip of

Colicum Reservoir and in the Dudley Parcel. It is also found on abandoned fields opposite the recreation area. Associates are red maple, gray birch, and white pine. This cover type is found on twelve acres.

Dam and Recreation Areas

The project area immediately around the dam (approximately 56 acres) is an aesthetically pleasing combination of water, field and forest. The parking lot at the damsite accommodates 12 vehicles for unstructured types of outdoor recreation on a day-use basis. The dam overlook provides a viewing point for the surrounding area suitable for fishing and all forms of non-consumptive recreational activities, i.e., hiking, wildlife, observation, picnicking, physical fitness, and sports.

Buffumville State Park (30 acres) has a 300-foot long sandy beach, 76 picnic tables, several fireplaces, rest rooms, bath house, 2 utility sheds, boat ramp, and a parking lot to accommodate 300 cars. Swimming is the main attraction and a life guard is provided by the Massachusetts Division of Forests and Parks. The remainder of the state-leased area (370 acres) is open to recreation use for hunting, fishing, hiking, and other activities requiring no formal facilities. The State charges a \$2.00 per vehicle fee for the use of the swimming beach and facilities. Wooded parts of the recreation area are predominately white pine.

Water

Water areas include the permanent pool at Buffumville Dam, Colicum Reservoir of Buffumville State Park and the Little River and its tributaries, Potter Brook and South Fork. Buffumville Lake and Colicum Reservoir compose 200 acres of water surface with short segments of the slow-moving, shallow Little River flowing into and out of these pools. Water surfaces total about 210 acres of feeland at the project.

SECTION 4. FOREST MANAGEMENT

Factors Influencing Forest Management

Several factors influence the management of forest resources at Buffumville Lake. These factors need to be considered and evaluated when developing viable programs for forest management that will minimize adverse effects and optimize the benefits obtainable from the project resources.

Access

The Corps of Engineers owns a 30-100 foot wide strip of land around the permanent pool at Buffumville Lake. There is no access to most of this land except across private property or by boat. The lack of access and narrow land restricts active forest management.

Aesthetics

Buffumville Lake is an intensively used recreation area. The aesthetics of the area are very important and must be protected. Silvicultural operations will not degrade the aesthetic quality of the area, and tree removal from recreation areas and the lake shore will be restricted. Selective tree removal will be favored and applied to only those trees presenting a safety risk to the public or a health problem to surrounding trees.

Forest Protection

The most effective method of protecting the forest from disease and insect pests is the maintenance of vigorous, healthy forest stands. Proper silvicultural practices providing a diversity of species and age classes with good vigor will normally prevent major infestations.

Direct approaches, i.e., chemical spraying, to disease and pest problems will be used only to deal with individual trees of extremely high value or with an infestation that has attained or is likely to attain epidemic proportions. In such cases only EPA registered pesticides will be applied and coordinated with the Massachusetts Department of Environmental Management.

Insects

Several insect pests occur throughout the reservoir but have not, as yet, caused serious damage. These include the white pine weevil (Pissodes strobi), saddled prominent (Heterocampa guttivitta), fall webworm (Hyphantria cunea), tent caterpillars (Malacosoma spp.), and the gypsy moth (Porthetria dispar). The white pine weevil female burrows into the terminal shoot, to lay her eggs. This results in a crooked or multi-stemmed pine of reduced aesthetic and commercial value as lateral branches

assume apical dominance. Young pine growing in partial shade have a reduced incidence of infestation.

Gypsy moths defoliate hardwood trees, black cherry and oaks being preferred host species. Vigorous hardwoods will die if repeatedly defoliated over several years, unhealthy trees and any evergreens can succumb after a single infestation.

Numerous gypsy moth egg masses were noticed during the forest inventory. Infestation should be monitored and any trees killed should be salvaged if accessible. It has been determined by the Massachusetts Department of Environmental Management that the gypsy moth population is building in the town of Charlton. If warranted, control will be used in the form of pesticide spraying of registered chemicals or *Bacillus thuringiensis* on shade trees and lawn ornamentals.

Diseases

No tree diseases were found to be occurring in significant numbers to pose an immediate problem. Should a serious outbreak of disease or insect damage occur, entomologists or pathologists from the U.S. Department of Agriculture and/or the University of Massachusetts will be asked for technical advice.

Air Pollution

Air pollution is not known to be a serious threat to the forest at Buffumville Lake. The effects of acid rain on the forest and aquatic resources of northeastern North America due to increased fossil fuel consumption is becoming a serious concern. The soils in New England lack the ability to buffer the acidity leading to decreased pH levels in streams and lakes. Fish populations cannot tolerate low pH (≤ 5.5) on a sustained basis and will die. Stream acidity will be monitored in the future to warn of impending problems.

Erosion Control

Bank slumping has occurred on the south slope adjacent to the outlet channel. Following restoration and stabilization the entire slope will be planted with ground covers and shrubs to prevent further erosion, and reduce the need for mowing on this steep slope. Restoration and planting will be done by contract.

An area between the boat ramp and Oxford Road is beginning to erode. Shrubs will be planted to hold the soil and to improve appearances to the public. The use of sweet-fern (*Comptonia peregrina*) is an excellent species for this purpose.

The steep slope between the access road and storage building is being undercut by water. Measures must be taken to restore this area and

prevent future erosion before there is tree mortality and a collapse of the stone wall along the top of the slope. This problem occurs at the entrance to the damsite and immediate attention should be given to correct this area and aesthetically improve the entrance to project lands. Recommended shade tolerant species include Mountain Laurel (Kalmia latifolia), Rosebug Rhododendron (Rhododendron maximum) and Barberry (Berberis thunbergii).

Plantings

The former borrow area along the access road to the dam will be replanted to beautify the area and provide for wildlife habitat as shown in Exhibit B. A small clearing near the center will be maintained by periodic brushcutting and surrounding land will be planted with suitable shrubs preferred by wildlife and with small clumps of trees for cover.

Planting will be conducted in the area between the boat ramp and Oxford Road to stabilize the soil, and to improve the appearance of the area.

The south slope of the outlet channel will be planted with ground covers and low shrubs to hold the soil, provide food and cover for birds, and eliminate the need to mow on the steep slopes.

Thinnings

A complete forest inventory conducted in 1980 determined thinning needs for immature stands. Once stand examinations begin, the method and timing of all intermediate cuttings and all prunings will be designated for specific stands.

Thinnings reduce competition among trees for light, moisture and nutrients and encourage the development of understory and ground vegetation which is needed for wildlife food and cover requirements. Thinnings are used to increase growth in stagnated or desired trees, to regulate stand density, and to create a diversity of species and age classes. The operation usually involves removal of poor risk and poor quality trees.

Maintenance of stand vigor is important but will be subordinate to stand attractiveness in recreation areas. In the vicinity of recreation sites, cutting will be limited to removing hazardous, dying, or diseased trees that threaten the health and beauty of the forest or the safety of its users. Care will be taken to prevent damage to residual trees and ground vegetation. Slash may be chipped and used as mulch on critical sites. If the slash is to be piled, it will be done in such a manner as to provide cover for wildlife. All stumps will be cut close to the ground.

All tree removal will be conducted with the goal of how residual stands will look, and will create an interesting variety of forest

patterns. Trees and shrubs that add the beauty of flowers and colorful fruit and foliage in the autumn will be favored. In some stands, thinning will be used to release promising young oaks and other trees having potential for greater mast production.

Light thinning in the recreation area will be conducted during the winter months. The possibility of drawing the timber by horses or oxen will be investigated for this area and other areas. Skidding with animals results in less impact on the soil and young vegetation and would generate public interest.

Other Forest Management Operations

Boundary Maintenance

A boundary survey was completed in 1976. Boundary lines of sight will be cleared to a 3' wide path. Corner monuments will be marked by posting standard aluminum boundary signs as well as painting adjacent trees with red and white bands (each 3" wide). The boundary lines between monuments will be marked by posting a standard boundary sign at each 200'-300' interval. Trees will also be blazed in the line of sight. Rectangular blazes will be cut approximately 6" long and painted red and white. All signs will face adjoining property with blazes facing the line of sight on both sides of the tree.

In areas near private homes, signing and blazing may be reduced to a minimum if they are a visual nuisance to adjacent landowners.

This distinct boundary marking technique will make it easier for the public to know when they enter or leave Federal property to minimize the possibility of encroachments. This will also facilitate maintenance and resource management activities for Corps personnel.

The Park Rangers will have primary responsibility for the periodic inspection of boundaries.

Fuelwood Cutting

Timber stand improvements in some areas can be accomplished through fuelwood cutting. Fuelwood permits can be issued for areas accessible to the public. Any firewood cutting must be closely coordinated with the Massachusetts Division of Forests and Parks and carefully supervised by the Corps of Engineers' Park Rangers.

People issued fuelwood permits should understand that their cutting is part of a planned effort to improve the quality of the woods. A brochure outlining management objectives and the importance of preventing damage to seedlings and remaining trees should be provided along with the fuelwood permit.

Salvage Cutting

A severe recurring infestation of gypsy moth may result in a high amount of tree mortality. Should this happen, most of the dead trees will be salvaged as soon as possible, leaving some of the larger ones for den trees. Since access to most areas is poor or non-existent, logging may have to be conducted during the winter over the frozen lake.

Salvageable trees without commercial timber value will be disposed of by issuing fuelwood permits.

Management Direction

All silvicultural operations will be implemented under the direction of a Corps Park Ranger or forester. The Ranger/forester will mark trees to be cut prior to undertaking silvicultural work.

SECTION 5. AQUATIC MANAGEMENT

Existing Management

Fisheries management is performed by the Massachusetts Division of Fisheries and Wildlife (referred to as the Division) at Buffumville Lake. The reservoir supports a warm water fishery. The Division stocks trout in the South Fork, Little River, as well as on other tributary streams on private property on a put and take basis. Fish are stocked in the spring in numbers which vary each year according to availability from the hatchery. Trout are stocked at one point on Corps property on the South Fork, Little River. In recent years about 300 eastern brook trout (Salvelinus fontinalis) are stocked in the 6 to 9 inch class, depending on availability.

Tiger muskies (Esox lucius x E. masquinongy) were stocked in Buffumville Lake by the Division in September 1980 on an experimental basis. It is hoped that this sterile hybrid fish will control the panfish populations and provide a trophy-size fish for the recreational sport angler.

The Division sampled the fish population of Buffumville Lake in June 1978 using gill nets and electroshocking. A total of ten species were found including single brown trout (Salmo trutta), chain pickerel (Esox niger), largemouth bass (Micropterus salmoides), yellow perch (Perca flavescens), white perch (Morone americana), pumpkinseed (Lepomis gibbosus), bluegills (L. macrochirus), yellow bullheads (Ictalurus natalis), brown bullhead (I. nebulosus), and white suckers (Catostomus commersoni).

Endangered Species

No endangered aquatic species are known to exist in Buffumville Lake.

Factors Influencing Fish Management

Habitat

The principal factor influencing fish management is the nature of the habitat. The impoundment area is bisected by Oxford Road into Colicum Reservoir with a 6.1 foot mean depth and Buffumville Lake proper with a 7.6 foot mean depth. Sufficient macrophyte populations are necessary for cover as well as sunken logs and boulders.

Water Quality

Buffumville Reservoir and its tributary streams have a Class B water quality according to the Massachusetts Division of Water Pollution Control, and was determined to be mesotrophic. Water quality characteristics are routinely gathered and analyzed as part of the NED

quality management program. Water quality parameters are also measured prior to stocking fish by the Division to insure adequate fish survival and highest fishing success. At present, the water quality is sufficient to support the fishery. It is necessary to maintain and monitor conditions to prevent or correct problems. Off-site pollution presents the greatest threat of water degradation.

The water is light brown in color, limiting transparency to about 5.5 feet. In July 1976, pH ranged from 6.0 to 7.2 depending on location and depth.

Water Level Fluctuation

Reservoir regulation for flood control will continue to periodically alter lake levels, but this environmental change is not considered significantly disruptive to aquatic life. Regulations can be instrumental in controlling excessive macrophyte populations as they occur.

A 10 to 11 foot recreation pool is maintained year-round, with substantial changes only due to the storage of flood waters. Regulation is normally short termed and does not usually result in environmental degradation. Flooding vegetation increases the productivity of the water and may benefit the spawning of warm water species such as pickerel and perch. Flooding in May or June is rare, but could be detrimental to the spawning of some species by leaving the eggs exposed to air or in too shallow water following subsequent drawdown.

Aquatic Weeds

Aquatic plants are common, particularly along the western shoreline. Milfoil (Myriophyllum exalbescens), pickerel weed (Pontederia cordata), St. John's wort (Hypericum sp.), sedges (Cyperaceae), and arrowhead (Sagittaria teres) are abundant in Buffumville Lake and common in Colicum Reservoir. Other aquatic vegetation includes water shield (Brasenia schreberi), broad-leaved cattail (Typhas latifolia), bladderwort (Utricularia sp.), and pondweed (Potamogeton sp.).

Several groups of submerged tree stumps and standing dead trees are located on the eastern shore of the southern impoundment.

Pesticide Use

Herbicides are used on rock slopes, riprap, and the emergency spillway channel to control nuisance plant growth. In 1980 5.0 acres were treated by contract using HYVAR-XL at a rate of 6 gallons per acre.

Future applications of herbicide will be held to a minimum and be conducted by licensed applicators using chemicals according to the constraints set by the Environmental Protection Agency.

Access and Fishing Pressure

The area is accessible to fishermen by footpaths that begin in the State Park and by boat. Parking is available for 300 cars at Buffumville State Park. Boats can be launched from a gravel ramp off Oxford Road opposite the entrance to the State Park.

Trails will be cleared, marked, and maintained for fishermen access and other recreational use. Off-road vehicle damage to trails will be monitored and boulders or gates used to restrict their use in primitive, natural areas.

Parking for the boat ramp is inadequate and the gravel ramp is deteriorating. An enlarged parking lot and paved road and ramp is a priority.

Fishing pressure is estimated by the Division of Fisheries and Wildlife as moderate. A creel census to determine species taken and fishing pressure will be conducted.

Exhibit B, Map 2 shows principal angler access.

Aquatic Management Program

Habitat Improvement and Maintenance

The creel census will assist in determining the adequacy of current management efforts, obtain harvest data on largemouth bass and other species, and to monitor fishing pressure.

The condition of the tiger muskies will be monitored to determine if they have become successfully established and if they are controlling the panfish populations.

Law Enforcement

The enforcement of fish and wildlife laws is accomplished primarily by the Natural Resource Officers of the Department of Environmental Affairs. Additional enforcement is also conducted by personnel of the Division of Fisheries and Wildlife, and the State police.

SECTION 6. WILDLIFE MANAGEMENT

Major Species

Wildlife that can be seen in the area include red fox (Vulpes fulva), raccoon (Procyon loter), porcupine (Erethizon dorsatum), woodchuck (Marmota monax), snowshoe hare (Lepus americanus), cottontail rabbit (Sylvilagus floridanus), beaver (Castor canadensis), skunk (Mephitis mephitis), muskrat (Ondatra zibethica), and gray squirrel (Sciurus carolinensis pennsylvanicus).

Upland bird species include woodcock (Philohela minor), and ruffed grouse (Bonasa umbellus).

Several species of ducks have been seen on Buffumville Lake including mallards (Anas platyrhynchos platyrhynchos), black ducks (A. rubripes), and wood ducks (Aix sponsa). Canada geese (Branta canadensis) stop each year during their migrations.

It is unlikely that there is a resident deer population in the project area due to its limited size above normal pool elevation, however it is likely that occasional migrants move through the area.

Endangered Species

Rare or endangered species generally are associated with rare habitat types or have exacting requirements with respect to a host of environmental factors. The habitat at Buffumville Lake is not uncommon and no rare or endangered species have been found.

Factors Influencing Wildlife Management

Forest Management Effects on Wildlife

Timber stand improvements such as thinnings and small patchcuts may result in attracting wildlife by enhancing the habitat for those species that take advantage of the new herbaceous and woody plant growth. A diversity of habitats provides for a varied ecotone which is preferred by most wildlife species.

Thinning around vigorous young oaks will be enacted to increase mast production. Small clearings will favor the regeneration of aspen, cherry, birch, and other intollerant species commonly used by many animals.

Hunter Access and Designation of Hunting Areas

Hunting at Buffumville Lake is limited due to the lack of public access to the narrow strip of public land surrounding the lake and the residential nature of the surrounding area.

Duck hunters frequent the southern end of Buffumville Reservoir as shown on Exhibit B, Map 2. Access to the area is by boat or by crossing private property because there is no public access to this part of the property.

Wildlife Observation

The aesthetic values of wildlife observation are the most important human values of wildlife management at Buffumville. Small mammals and birds residing on the fringes of picnic areas, along roadsides, and the lakes are perhaps the most noticeable residents. Visitation by sightseers will be enhanced by good cultural practices aimed at providing adequate food and cover near these sites.

Marking a system of trails from Buffumville State Park north along Colicum Reservoir will give visitors an opportunity to observe a greater variety of wildlife in a variety of habitats.

Wildlife Management Program

Existing Management

The only wildlife management in the project area consists of installation and management of wood duck boxes on the islands of the south impoundment. The wood duck is a beautiful, highly colored bird which nests in cavities in trees that will take readily to artificial nesting boxes where natural nesting sites are unavailable.

Habitat Improvement and Maintenance

The wetlands on the edges of the reservoir offer good potential for waterfowl habitat improvement. Wood duck boxes will be erected there and checked and cleaned annually by project personnel. Placement of these boxes, as well as boxes for kestrels, purple martins, bluebirds, and other songbirds cost little, are easily built, require little maintenance beyond an annual check, and attract colorful birds that are enjoyed by visitors.

An essential element to any successful wildlife management program is to maintain a wide range of habitat types. Den trees, fruit trees, emerging vegetation, and forest successional types will be kept in balance to perpetuate the greatest diversity of species at Buffumville Lake.

Reforestation and other plantings will use a combination of shrubs bearing fruit preferred by wildlife and trees.

Law Enforcement

The enforcement of fish and wildlife laws is accomplished primarily by the Natural Resource Officers of the Department of Environmental Affairs. Additional enforcement is also done by personnel of the Division of Fisheries and Wildlife, the Division of Forest and Parks, and the State Police.

SECTION 7. SPECIAL NEEDS

Training

Cooperation with all resources agencies in the planning and action stages of wildlife management will incorporate interagency training and university instruction for field managers. Implementation of current programs by the Massachusetts Division of Forests and Parks will involve sharing of personnel as part of the desired cooperative assistance.

Multi-disciplinary training will receive high attention but participation in on-site resource management activities will also be stressed. Procedures and standardization of user surveys and status fish and game laws are among many items in which Corps rangers need instruction. As conditions arise, managers are urged to identify other training needs and coordinate programs applicable to their management activities.

Research Cooperation

The Corps of Engineers supports university research and studies that attempt to solve current forestry and wildlife management problems. Buffumville Reservoir is open for any such activities that will benefit the education of university students, research personnel and environmental programs at Buffumville. Resulting research will lead to better resource management.

A wildlife census to determine the species and population conditions at Buffumville is needed to evaluate management efforts.

Information and Education

Information and education are important aspects of the forest, fish and wildlife management program. It is imperative that the public be informed of management decisions and programs. Efforts will be made to publicize programs and actions, such as timber sales and habitat improvement work.

Educational efforts will be directed at explaining the purposes behind natural resource management and broadening the general public's understanding of ecological relationships.

The image and understanding of the Corps recreation - resource management program can only be enhanced by public contacts initiated through an organized public relations program.

Current information and education efforts concerning forests, fish and wildlife at Buffumville Lake will be expanded to include attractive brochures that are educational, informative, and specific to the property.

Interpretive Programs

The possibility of presenting interpretive programs at Buffumville State Park will be discussed with personnel from the Massachusetts Department of Environment Management. Topics could include natural history, resource management and the operation and role of Buffumville Dam for flood protection.

SECTION 8. PERSONNEL AND FUNDING REQUIREMENTS TO IMPLEMENT PLAN

The implementation of this management plan will initially require the personnel and funding allocations described below.

Plant trees in borrow area, near boat ramp, and at access road entrance.

| | | |
|--|---|------------|
| 1 GS 7 Park Ranger for 2 weeks | = | \$1,013.00 |
| 1 GS 4 Forest Tech for 2 weeks | = | 833.00 |
| 1 WB 5 Helper for 2 weeks | = | 833.00 |
| 1 Tractor (project owned) @ \$25/day for 10 days | = | 250.00 |
| Plant materials, fertilizer, mulch | | |
| 1/4 x 2 P/U truck @ \$30/day | = | 300.00 |

Requirements for Government personnel to implement the other forest management portions of the plan are dependent on the extent to which the fuelwood permit program is utilized for accomplishing the timber stand improvements. Preparation work for commercial contracts will require additional manhours.

Fish and Wildlife Management

| | | |
|--|---|------------|
| 1 GS 7 Park Ranger for 2 weeks | = | \$1,013.00 |
| Creel study planning, coordination with Mass. Fisheries and Wildlife personnel | | |
| 1 GS 4 Wildlife Aid for 10 weeks | = | \$4,200.00 |
| Creel survey, wildlife survey, construc- tion, placement, and cleaning of bird boxes. | | |
| Clear and mark trails | | |
| Improve boat ramp and parking area | | |

EXHIBIT A

Table 1
Land Classification and Forest Types
(ACRES)

| | |
|--------------------------------|------------|
| Project Operations/lawns/roads | 56 |
| Abandoned Field | 8 |
| Water | 200 |
| Forest | 183 |
| Recreation Area | 41 |
| TOTAL | <u>488</u> |

Forst Types

| | |
|---------------------------------------|------------|
| Aspen | |
| 16-2-B | 12 |
| White Pine/Northern Red Oak/White Ash | |
| 20-2-B | 27 |
| 20-3-A | 74 |
| White Pine | |
| 21-3-A | 37 |
| White Oak | |
| 53-3-A | 14 |
| Northern Red Oak/Basswood/White Ash | |
| 54-3-A | 19 |
| TOTALS | <u>183</u> |

Table 2

Timber Volume Estimates for Individual Species and Forest Cover Types
Board Foot International 1/4 Inch Rule

| | <u>20-2-B</u> | <u>20-3-A</u> | <u>21-3-A</u> | <u>53-3-A</u> | <u>54-3-A</u> | <u>Species Totals</u> |
|------------|-------------------|----------------|-------------------|---------------|-------------------|-----------------------|
| Red Maple | 40,500 | 13,875 | | | | 54,375 |
| White Pine | 41,850 | 146,798 | 84,915 | | | 273,563 |
| Red Oak | | 13,875 | 49,950 | 5,600 | 11,780 | 81,205 |
| White Oak | <u> </u> | <u>108,225</u> | <u> </u> | <u>5,600</u> | <u> </u> | <u>113,825</u> |
| | 82,350 | 282,773 | 134,865 | 11,200 | 11,780 | 522,968 |

Table 3

Common and Scientific Names of Trees at Buffumville

| | |
|------------------------------|------------------------------------|
| <u>Acer rubrum</u> | red, swamp, or soft maple |
| <u>Acer saccharum</u> | sugar, rock, or hard maple |
| <u>Betula alleghaniensis</u> | yellow birch |
| <u>Betula populifolia</u> | gray birch |
| <u>Carya ovata</u> | shadbark hickory |
| <u>Fraxinus americana</u> | white ash |
| <u>Pinus strobus</u> | eastern white pine |
| <u>Pinus sylvestris</u> | scotch pine |
| <u>Populus grandidentata</u> | bigtooth aspen |
| <u>Populus tremuloides</u> | trembling or quaking aspen, poplar |
| <u>Prunus pensylvanica</u> | pin cherry |
| <u>Prunus serotina</u> | black cherry |
| <u>Quercus alba</u> | white oak |
| <u>Quercus rubra</u> | northern red oak |
| <u>Tilia americana</u> | American linden, basswood |
| <u>Tsuga canadensis</u> | eastern hemlock |

Table 4

Common and Scientific Names of Fish and Wildlife at Buffumville Lake

Fish

Bass, largemouth
Bluegill
Bullhead, brown
 , yellow
Muskie, tiger
Perch, white
 , yellow
Pickerel, chain
Pumpkinseed
Sucker, white
Trout, brown
 , eastern brook

Micropterus salmoides
Lepomis gibbosus
Ictalurus nebulosus
I. natalis
Esox lucius x E. masquinongy
Morone americana
Perca flavescens
Esox niger
Lepomis gibbosus
Catostomus commersoni
Salmo trutta
Salvelinus fontinalis

Major Mammal Species

Beaver
Fox, red
Hare, snowshoe
Muskrat
Porcupine
Rabbit, cottontail
Raccoon
Skunk
Squirrel, gray
Woodchuck

Castor canadensis
Vulpes fulva
Lepus americanus
Onadatra zibethica
Erethizon dorsatum
Sylvilagus floridanus
Procyon loter
Mephitis mephitis
Sciurus carolinensis pennsylvanicus
Marmota monax

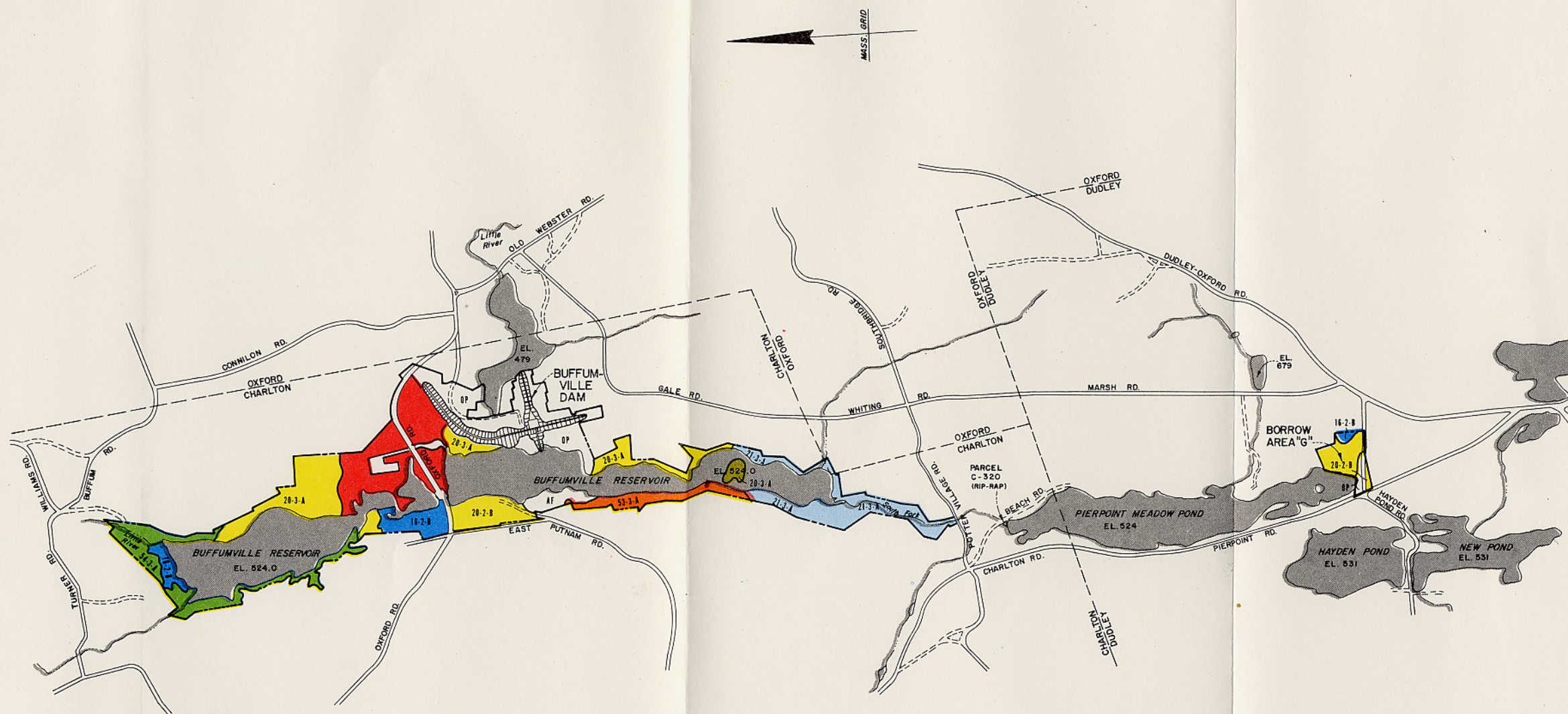
Waterfowl and Upland Birds

Duck, black
 , mallard
 , wood
Geese, Canada
Grouse, ruffed
Woodcock

Anas rubripes
A. platyrhynchos platyrhynchos
Aix sponsa
Branta canadensis
Bonasa umbellus
Philohela minor

REFERENCES

- Clark, F.B., et al. 1970. The Silviculture of Oaks and Associated Species. USDA Forest Service Res. Pap. NE-144, 66 pp.
- Lancaster, K.F. and W.B. Leak. 1978. A Silvicultural Guide for White Pine in the Northeast. USDA Forest Service Gen. Tech. Report NE-41. 13 pp.
- Madore, R. 1980. Lake Report for Buffumville Lake. Unpublished report. Massachusetts Division of Fisheries and Wildlife.
- Society of American Foresters. 1975. Forest Cover Types of North America. Bethesda, Maryland. 67 pp.



S.A.F. COVER TYPES AND LAND CLASSIFICATION

- Open Water
- Roads
- Boundary of Land Owned in FEE by the United States Government
- Aspen
- White Pine - Northern Red Oak
- White Pine
- White Oak
- Northern Red Oak - Basswood - White Ash
- Buffumville State Park Intensive Recreation
- Abandoned Field
- Operations

EXAMPLE 16 - 2 - B

S.A.F. Cover Type

Stocking (% Crown Closure)

Height

A-81-100
B-61-80
C-41-60






1-0'-20'
2-21'-40'
3-41'-60'
4-61'-80'
5-81'-100'

FOREST COMPARTMENTS AND COVER TYPES OF BUFFUMVILLE LAKE

800 0 800 1600 2400



SYMBOLS

-  - Open Water
-  - Duck Areas
-  - Parking Areas
-  - Boat Ramp
-  - Wildlife Habitat Improvement

WILDLIFE MANAGEMENT-
RECREATION AREAS
BUFFUMVILLE LAKE

800 0 800 1600 2400